

**REMARKS**

Claims 1-20, 22-48, 53-56 and 63-80 were pending when the present Office Action was mailed July 11, 2008. In this response, claims 1-3, 13-16, 19, 20 and 23-26 have been amended and no claims have been canceled. No new matter has been added by way of these amendments. Accordingly, claims 1-20, 22-48, 53-56 and 63-80 are currently pending.

In the July 11, 2008 Office Action, claims 1-20 and 22-27 were rejected and claims 28-48, 53-56 and 63-80 have been allowed. More specifically, the status of the application in light of the Office Action is as follows:

1. Claims 1-20 and 22-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of U.S. Patent No. 4,696,911 to Boerma ("Boerma"), Maskaev et al., *Selection of Catalyst for Commercial Production of 12-Hydroxystearic Acid – a Saponifiable Base for Greases*, (1973) ("Maskaev"), and European Patent No. 246,366 to White et al. ("White"); and
2. Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending U.S. Patent Application No. 10/567,727; and
3. Claims 28-48, 53-56 and 63-80 are allowed.

Reconsideration and withdrawal of the rejections set forth in the Office Action dated September 9, 2008 are respectfully requested.

I. **Examiner Interview**

The applicants' representative wishes to thank Examiner Carr for engaging in a telephone conference on December 9, 2008. During the telephone conference, the Examiner and the applicants' representative discussed the present Office Action. Specifically, the 35 U.S.C. § 103(a) rejection of pending claims 1-20 and 22-27 and the applied references of Boerma, Maskaev and White were discussed in detail. During the course of the discussion, the applicant's representative and the Examiner discussed possible amendments to the above mentioned claims to clarify the claims and to further distinguish the method steps of these claims. The specific amendments discussed by the applicant's representative and the Examiner are reflected in the Listing of Claims included herewith and are discussed in more detail below. The applicants' representative wishes to thank the Examiner for her suggestions

during the telephone conference. The following remarks summarize and expand upon the points discussed during the December 9 telephone conference. The applicants accordingly request that this paper constitute the applicants' Interview Summary. If the Examiner notices any deficiencies in this regard, she is encouraged to contact the undersigned representative.

II. Amendments

In this response, claims 1-3, 13-16, 19, 20 and 23-26 have been amended solely for clarification, and not for purposes of overcoming any art. As discussed in detail during the telephone conference on December 9 2008, support for the clarifying amendments can be found throughout the specification. Accordingly, no new matter has been added by way of these amendments.

III. Rejections Under 35 U.S.C. § 103

Claims 1-20 and 22-27 were rejected under 35 U.S.C. §103 as allegedly obvious over Boerma in view of Maskae and White. Applicant's respectfully traverse these rejections and request reconsideration of the claims in light of the remarks provided below.

A. The Present Claims

Independent claim 1, as amended, is directed to a method of hydrogenating an unsaturated feedstock. The method includes activating a nickel-based catalyst at a first temperature of at least about 100°C in the presence of a process gas and an unsaturated fat component, wherein activating the nickel-based catalyst includes hydrogenating the unsaturated fat component such that the catalyst is dispersed in a hydrogenated fat matrix to form an activated catalyst composition. The method also includes contacting the unsaturated feedstock with the activated catalyst composition and hydrogenating the unsaturated feedstock by sustaining a hydrogenation reaction at a second temperature of no greater than about 70°C. The feedstock comprises at least one unsaturated organic component.

Independent claim 23, as amended, is directed to a method of hydrogenating an unsaturated feedstock. The method includes activating a catalyst composition by heating a nickel-based catalyst to a first temperature of at least about 100°C in the presence of a

process gas and a fat component. Following the activating step, the method includes contacting the unsaturated feedstock with the activated catalyst composition and hydrogenating the unsaturated feedstock by sustaining a hydrogenation reaction at a second temperature of no greater than about 70°C, the feedstock comprising at least one unsaturated organic component, wherein a fat matrix of the activated catalyst composition has a melting point that is higher than the second temperature, and wherein the activated catalyst composition is at a temperature at least as high as the melting point when added to the unsaturated feedstock.

Summaries of additional independent claims are given below.

B. The Applied Art

BOERMA describes preparation of a finely dispersed nickel boride catalyst which has been stabilized with a linear organic polymer that can be used to hydrogenate unsaturated organic feedstock (Boerma, col. 1, lines 40-41, 55-56). The catalyst is made in a volatile polar solvent, such as ethanol, by reacting nickel salt with alkali borohydride in a solution containing a dissolved linear organic polymer containing pyrrolidone groups and also containing a partial fatty acid poly ester group to stabilize the catalyst (Boerma, col. 2, lines 13-21, 55-56). The reaction occurs "in a hydrogen or inert gas atmosphere at a temperature of between 0°C and 80°C, preferably between 20°C and 60°C" (Boerma, col. 2, lines 21-23; emphasis added). Upon completion of the reaction and the precipitation of the nickel boride catalyst, oil is added to the catalyst solution and the solvent is subsequently removed by vacuum evaporation at a temperature between 15°C and 60°C (Boerma, col. 2, lines 32-35).

MASKAEV describes preparation of reduced nickel catalysts from nickel carbonate and nickel formate salts in castor oil at 230°C - 250°C in a stream of hydrogen (Maskaev, page 436, ¶ 6). The resulting catalysts were used for castor oil hydrogenation experiments at 130°C (Maskaev, page 436, ¶ 4). Maskaeve's hydrogenation experiments were designed to select a catalyst for commercial production of 12-hydroxystearic acid for use in the production of high-quality greases (Maskaev; page 435, title, ¶ 1-2). Maskaeve focuses on the selectivity of the catalysts to produce saturated castor oil without accompanying side reactions that result in reduction of the 12-hydroxystearic acid, a process influenced "by such factors as temperature,

pressure, and hydrodynamic conditions of the contacting, but are also highly dependent on the nature and quantity of the catalyst" (Maskaev, pages 435-436, ¶ 2).

WHITE describes a process of hydrogenating liquid oils with a partially deactivated nickel catalyst at a hydrogenation temperature starting between 160°C and 200°C and gradually increasing the hydrogenation temperature to a final temperature of 210°C to about 250°C. The preferential temperature range taught by White is about 180°C to about 240°C (White, page 3, lines 21-26, and page 5, lines 23-25). White attempts to provide a hydrogenation process whereby a hydrogenation oil is produced that has a narrow melting range but is relatively stable (more solid than liquid) at room temperature (21°C - 33°C) (White; page 3, lines 15, 29-30 and 36-37). White relies on using a partially deactivated nickel catalyst, preferably a sulfur-poisoned deactivated nickel catalyst, to "control the rate of the reaction, and thereby the relative proportions of *cis*- and *trans*-fatty acid triglycerides in the products formed" (White, page 4, lines 40-43). As such, the fats produced according to White may contain small amounts of undesirable sulfur contamination.

### C. Analysis

As discussed during the December 9 telephone conference, the applicants have amended independent claims 1, 23, 24 and 26 to clarify the features of these claims. The amendments to these claims largely adopt those proposed by the applicant's representative and preliminarily agreed to by the Examiner during the telephone conference. Specifically, the claims were amended to clarify that the methods include "activating a nickel-based catalyst...to form an activated catalyst composition" (claims 1 and 26) or "activating a catalyst composition" (claims 23 and 24). To the extent the section 103 rejection is applied against the amended claims, Applicants respectfully request reconsideration.

Claim 1, as amended, is patentable over the combination of Boerma, Maskaev and White for at least the reason that the applied references do not expressly or impliedly suggest the claimed features (M.P.E.P. § 706.02(j)). Moreover, the applied references teach away from the claimed features as well as the proposed combination of references. Hence, there is a lack of reasoning with rational underpinning to support the legal conclusion of obviousness.

In the present case, amended claim 1 includes activating a nickel-based catalyst at a first temperature of at least about 100°C in the presence of a process gas and an unsaturated fat component. The features of activating a nickel-based catalyst at a temperature of at least 100°C, and activating a nickel-based catalyst in the presence of an unsaturated fat component, wherein activating the nickel-based catalyst includes hydrogenating the unsaturated fat component such that the catalyst is dispersed in a hydrogenated fat matrix to form an activated catalyst composition, are not shown or suggested by any one of Boerma, Maskaev, or White, alone or in combination.

Boerma teaches preparation of a nickel boride catalyst in a volatile polar solvent by reduction of nickel salt with a solution of alkali borohydride under a hydrogen or inert gas atmosphere at a temperature between 0°C and 80°C (Boerma, col. 2, ¶'s 2-3). Following the reduction of the insoluble nickel salt to form the nickel metal boride catalyst, Boerma's method calls for addition of oil and vacuum evaporation of the solvent at low temperature (e.g., 50°C) to prevent foaming and provide reproducible catalyst compositions (Boerma, col. 2, ¶'s 4-6).

Boerma does not teach activating a nickel-based catalyst, and teaches away from using a temperature of at least 100°C to treat the nickel salt or the resultant reduced nickel boride catalyst. For example, Boerma teaches a very specific temperature range of 0°C to 80°C for the reduction reaction, and further limits the solvent evaporation temperature from 15°C to 60°C to prevent foaming of the catalyst composition, a process that can hamper the evaporation process (Boerma, col. 2, lines 41-44, and col. 3, lines 47-48). Furthermore, and as described in Examples I-III, Boerma teaches first heating the nickel salt to a temperature of 55°C followed by addition of the sodium borohydride in ethanol at room temperature (see Boerma, col. 3, Example I, lines 27-37). As evidenced by the lack of heating following reduction and catalyst formation in these examples, Boerma does not teach activation of the nickel boride catalyst as described throughout the instant application and claimed in claim 1. Claim 1 is further distinguished from the teachings of Boerma in that oil is added to the nickel boride catalyst following the reduction steps (Boerma, col. 3, Example I, lines 38-40). Thus, Boerma teaches away from adding the catalyst to an unsaturated fat component and

hydrogenating the unsaturated fat component during an activation step, such that the catalyst is dispersed in a hydrogenated fat matrix.

Maskaev also teaches reducing insoluble nickel salt to the free metal to form nickel catalyst compositions in an autoclave (Maskaev, page 436, ¶ 6). In contrast to the claimed features, Maskaev does not teach activating a nickel-based catalyst in the presence of an unsaturated fat component, wherein activating the nickel-based catalyst includes hydrogenating the unsaturated fat component such that the catalyst is dispersed in a hydrogenated fat matrix to form an activated catalyst composition. Moreover, Maskaev teaches using the reduced catalyst formed by the nickel salt reduction process for hydrogenating castor oil "under the conditions that [Maskaev] found to be optimum for the hydrogenation of castor oil," and including a hydrogenation temperature of 130°C (Maskaev, page 436, ¶ 4).

Furthermore, the distinct process steps for forming catalyst compositions and the differing hydrogenation conditions used to hydrogenate unsaturated oil as taught by Boerma and Maskaev are not combinable. The catalyst forming conditions used by Boerma (e.g., use of a volatile polar solvent that must be removed without foaming) do not lend itself to higher reaction temperatures during the nickel salt reduction practice. Likewise, there is no suggestion or reasoning that the reduced catalyst formed in Maskaev's process steps would be effective with the hydrogenation conditions as recited in claim 1. In fact, as described in the instant specification, nickel-based catalysts, such as the nickel-based catalyst described by Maskaev, typically require either high temperatures or electrolysis to drive the hydrogenation reaction at an acceptable rate (see Specification, paragraph [0007]). Accordingly, the teachings of Maskaev do not cure the deficiencies of Boerma.

In direct contrast to the claimed features, White teaches use of a deactivated, and preferably sulfur poisoned, nickel catalyst in a hydrogenation process whereby a hydrogenation oil is produced that has a narrow melting range but is relatively stable (more solid than liquid) at room temperature (21°C - 33°C) (White; page 3, lines 15, 29-30 and 36-37). In the July 11, 2008 Office Action, the Examiner alleges that White at page 4, lines 53 teaches a nickel-based catalyst "contained in hardened coconut oil, which as one of ordinary

skill in the art knows is another way of saying, 'hydrogenated coconut oil'" (July 11, 2008 Office Action, page 3, lines 1-2).

Without commenting on or conceding the merits of the Examiner's position on these points, independent claim 1 has been amended for clarification. Specifically, claim 1 has been amended to clarify that the method includes activating a nickel-based catalyst at a first temperature of at least about 100°C in the presence of a process gas and an unsaturated fat component, and wherein activating the nickel-based catalyst includes hydrogenating the unsaturated fat component such that the catalyst is dispersed in a hydrogenated fat matrix to form an activated catalyst composition. As White discloses a process of preparing a sulfur-poisoned catalyst in melted hardened coconut oil (White, page 4, lines 53-58), White cannot be relied upon to supply the deficient elements of Boerma and Maskaeve, namely hydrogenating the unsaturated fat component such that the catalyst is dispersed in a hydrogenated fat matrix to form an activated catalyst composition.

Accordingly, since the cited documents fail to show or suggest all of the pending claim limitations, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. §103.

Claims 2-20, 22 and 25 depend from claim 1. Therefore, the Section 103 rejections of these dependent claims should be withdrawn for the reasons discussed above and for the additional features of these claims.

Amended independent claims 23, 24 and 26 include several features analogous to claim 1 (e.g., "activating a nickel-based catalyst...to form an activated catalyst composition" or "activating a catalyst composition"). Accordingly, for the reasons discussed above and for the additional features of these claims, the Section 103 rejections of claims 23, 24 and 26 are unsupported by Boerma, Maskaeve and White and should be withdrawn. For example, claim 23 requires a fat matrix of the activated catalyst composition to have a melting point that is higher than the second temperature. Claim 23 further recites that the activated catalyst composition is at a temperature at least as high as the melting point when added the unsaturated feedstock. The method of claim 24 includes activating a catalyst composition, introducing hydrogen into the unsaturated feedstock, and thereafter, contacting the

unsaturated feedstock with the activated catalyst composition. The method of claim 26 includes activating a nickel-based catalyst at a first temperature to form an activated catalyst composition, contacting the unsaturated feedstock with the activated catalyst composition and hydrogenating the unsaturated feedstock at a second temperature, and further includes cooling the hydrogenated feedstock from the second temperature to a third temperature under hydrogen pressure.

None of the applied references, alone or in combination, disclose or suggest all the claim elements of independent claims 23, 24 and 26. For example, Boerma and Maskaev disclose methods of reducing nickel salts to form nickel metal catalysts. White teaches using a deactivated catalyst in hydrogenation reactions to produce hydrogenated oil that has a narrow melting range but is relatively stable (more solid than liquid) at room temperature. Accordingly, the combination of Boerma, Maskaev and White fail to support a Section 103 rejection of obviousness of these claims.

Claim 27 depends from otherwise allowable claim 26. Accordingly, the Section 103 rejection of claim 27 should be withdrawn for the reasons discussed above and for the additional features of these claims.

IV. Provisional Rejection Under the Doctrine of Non-Statutory Obviousness-Type Double Patenting

Claim 1 stands provisionally rejected on the ground of non-statutory obviousness-type double patenting as allegedly unpatentable over claim 1 of co-pending US. Patent Application serial no. 10/567,727. Applicant is prepared to submit a terminal disclaimer when the claims of copending U.S. Patent Application No. 10/567,727 are allowed.

V. Allowed Claims

The applicants would like to thank the Examiner for allowing claims 28-48, 53-56 and 63-80. As such, these claims have not been amended in this response.

VI. Conclusion

In view of the foregoing, the claims pending in the application comply with the requirements of 35 U.S.C. § 112 and patentably define over the applied art. A Notice of Allowance is, therefore, respectfully requested. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned representative at (206) 359-8118.

Applicants believe no fees are due with this response. However, if any fee is due for consideration of this paper, please charge our Deposit Account No. 50-0665, under Order No. 334498005US2 from which the undersigned is authorized to draw.

Respectfully submitted,  
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